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Board Characteristics and Environmental Remediation Disclosure of Listed Oil and Gas Firms in Nigeria and South Africa

Mbonu, Chikwelu Maduabuchi; Okoye, Emmanuel Ikechukwu

Department of Accountancy, Nnamdi Azikiwe University, Awka, Anambra State, Nigeria

ABSTRACT

This study assessed the effect of Board Characteristics on Environmental Remediation Disclosure of listed Oil and Gas firms in Nigeria and South Africa for eleven (11) years period ranging from 2011-2021. Audit Committee Size and Ownership Concentration were used to measure Board Characteristics. On the other hand, Environmental Remediation Disclosure served as the dependent variable. The study employed secondary data extracted from the Nigerian Exchange (NGX) Group and Johannesburg Stock Exchange (JSE) fact books, annual reports and accounts, stand-alone sustainability reports of sample firms. The study adopted *Ex-post facto* research design while the panel data sets were analyzed using Pearson Correlation matrix and Panel Least Square Regression analysis via E-Views 10.0. The result revealed that Audit Committee Size has a significant and positive effect on Environmental Remediation Disclosure (β_1 = 0.040140; p-value = 0.0000); Ownership Concentration has a significant but negative effect on Environmental Remediation Disclosure (β_2 = -0.194875; p-value = 0.0035) of listed Oil and Gas firms in Nigeria and South Africa at 5% level of significance respectively. In conclusion, the study upholds that Board Characteristics significantly affects Environmental Disclosure of listed Oil and Gas firms in Nigeria and South Africa. It was recommended inter alia that in an attempt to decrease agency problems and spur managers to promote firm performance and involvement in environmental practices, the audit committee in a company should be encouraged and sustained.

KEYWORDS: *Audit Committee Size, Ownership Concentration, Environmental Remediation Disclosure*

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INTRODUCTION

The contemporary business environment is characterised by uncertainty and risk, making it increasingly difficult to forecast and control the tangible and intangible factors which influence firm performance. Customers are becoming more demanding, necessitating increased focus on managerial professionalism and quality of service delivery. In response to the external pressures, firms resort to different strategic responses such as restructuring, downsizing, business process reengineering, benchmarking, total quality management and management by objectives to improve and sustain their competitive positions. In a dynamic environment, boards become very important for smooth functioning of organisations. Boards are expected to perform different functions, for example, monitoring of management to mitigate agency costs, hiring and firing of management, provide and give access to resources, grooming Chief Executive Officer and providing strategic direction for the firm (Mbonu & Amahalu, 2022).

Accordingly, companies globally are increasingly concerned with environmental issues. Most have realized that the environment is an asset to be managed and that environmental reporting is pertinent. However, while firms in the developed world tend to develop their environmental reporting practices voluntarily, those in the developing world leave it to the government to mandate such practices. Corporate environmental performance becomes more important issue for stakeholders because of the

harmful impact of firm's operations on environment. Society and government are pressuring firms to disclose more environmental information and to adopt a production strategy that improves the environmental performance, provides low-carbon products and reduces greenhouse gas emissions and environmental pollution. In response to these pressures, environmental issues are increasingly considered in firms' activities. Moreover, firms disclose more information about their operations and activities to enhance their reputation and to decrease information asymmetry, agency costs and the cost of capital. All these benefits encourage managers to be forthcoming, and to present good environmental behavior (Okudo & Amahalu, 2023). Corporate environmental disclosure simply refers to self-reporting of firms' environmental impact information to stakeholders. The communication of this information is done in a variety of different forms and mediums such as the annual reports, stand-alone environmental reports, pamphlets, documentaries, brochures.

Over the years, the negative environmental impact of economic development has become a matter of public concern in different parts of the world. After noting the many risks that have affected the environment as a result of the tremendous development in the field of industrial technology, this has led to increased demand for environmental disclosure for companies, considering that environmental disclosure is a tool to provide environmental information to stakeholders and to reflect the environmental performance of companies and concerns about various environmental issues. There is a theoretical assumption that the characteristics of Boards have a potential impact on the companies' performance (Modozie & Amahalu, 2022). Many scholars have analysed the relationship between board characteristics and performance, yet conclusions have not been entirely clear thereby, inconclusive. For instance, recent evidence from the literature suggests there is a positive link between board characteristics and firm performance (Amahalu & Moedu, 2023; Uniamikogbo and Ali, 2021) Similarly, Amahalu and Osonwa (2023); Muhammad, Karim, Nor and Ismail (2022) found a negative link, while, Muyiwa and Odugbemi (2021) uphold that there is no significant relationship between board characteristics and firm performance. These mixed results created a gap in literature which this study tends to fill.

Objectives of the Study

The main objective of this study is to evaluate the effect of Board Characteristics on Environmental Remediation Disclosure of listed Oil and Gas firms in Nigeria and South Africa. The specific objectives are:

1. To examine the effect of Audit Committee Size on Environmental Remediation Disclosure of listed Oil and Gas firms in Nigeria and South Africa.
2. To assess the effect of Ownership Concentration on Environmental Remediation Disclosure of listed Oil and Gas firms in Nigeria and South Africa.

Research Hypotheses

H_{01}: Audit Committee Size has no significant effect on Environmental Remediation Disclosure of listed Oil and Gas firms in Nigeria and South Africa.

H_{02}: Ownership Concentration has no significant effect on Environmental Remediation Disclosure of listed Oil and Gas firms in Nigeria and South Africa.

Conceptual Review

Board Characteristics

Diversity in board characteristics differentiates one person from another. This includes biological characteristics of race, gender, age, colour, national origin as well as family and society in which they were born into. Social and cultural identity refers to the personal affiliation with groups that research has shown to have significant influence on peoples' major life experiences. These affiliations basically include gender, race, national origin, religion, age cohort, and work specialization amongst others. The Board makes decisions as a fiduciary on behalf of shareholders. In addition to those duties, a board of directors is responsible for helping a corporation set broad goals, supporting executive duties, and ensuring the company has adequate, well-managed resources at its disposal (Mbonu & Amahalu, 2021a). Board characteristics aims to highlight a broad spectrum of demographic attributes and characteristics in the boardroom. A simple and common measure to promote heterogeneity in the boardroom commonly known as gender diversity is to include female representation on the board (Amahalu & Okudo, 2023). Homogenous boards can breed ignorance, group think and lead to bad decision making at the highest level. This is why diversity matters, and why all future-facing companies require a diversity policy at board level.

Audit Committee Size

Audit committee is a committee consisting of members of the Board of Directors, charged with overseeing the entity's system of internal control over financial reporting, internal and external auditors, and the financial reporting process. The sizes of all Audit Committees are between 3 and 9 members, with 5 committees having a mix of external expert members and internal members (Mbonu & Amahalu, 2021b).

Most audit committees have 3-4 members and are usually chaired by persons with experience as a Chief Finance Officer, external auditor, or Chief Executive Officer. Audit committees meet 6-10 times per year, either face-to-face or via teleconference, with the former lasting from 1–4 hours and the latter 1–2 hours. The audit committee is generally composed of three to five members, the majority of whom should be board members. The Audit Committee shall consist of a minimum of 3 directors with independent directors forming a majority. The majority of members of Audit Committee including its Chairperson shall be persons with ability to read and understand, the financial statement (Amahalu & Okudo, 2023). The audit committee shall meet at least 4 times in a year and not more than one hundred and twenty days shall elapse between two meetings.

Audit Committee Size = Audit committee size measured by the number of members in the audit committee

Ownership Concentration

Ownership concentration is a significant internal governance mechanism in which owners can control and influence the management of the firm to protect their interests. Ownership concentration. is defined by the number of large-block shareholders and the total percentage of the firm's shares they own (Okudo, Amahalu & Oshiole, 2023). Ownership Concentration is the amount of share capital that are not actively traded in the open market and, therefore, it represents a significant internal governance mechanism in which the block-owners can control and influence the management of the firm to protect their interests (Okudo, Ezechukwu, & Amahalu, 2022). When there is high ownership concentration, majority shareholders can focus better on firm strategies, putting less effort into coordination between principals, so the firm can maximize benefits and reduce costs more effectively.

Environmental Remediation Disclosure

Environmental Remediation costs means all costs and expenses of actions or activities to cleaning up or removal of hazardous materials from the environment; preventing or minimizing the further movement, leaching or migration of hazardous materials in the environment; preventing, minimizing, or mitigating the release or threatened release of hazardous materials into the environment, or injury or damage from such release, and comply with the requirements of any environmental laws. Environmental remediation costs include, without limitation, costs and expenses payable in connection with the foregoing for legal, engineering or other consultant services, for investigation, testing, sampling, and monitoring, for boring, excavation, and construction, for removal, modification or replacement of equipment or facilities, for labor and material, and for proper storage, treatment, and disposal of hazardous materials (Udo, Oraka & Amahalu, 2022).

Board Characteristics and Environmental Remediation Disclosure

A well-designed ownership structure can help to reduce agency problem, and in this way, the performance of the firm will be increased. However, sometimes ownership structures can increase agency cost, and by doing so, the value of the firm will be reduced (Okudo, Mbonu & Amahalu, 2022). Large shareholders have the advantage to play their role in the management of the firm, by this way agency problem can be resolved. Shareholders can get the necessary information in a concentrated ownership structure. This can be helpful for the efficient monitoring system. Due to efficient monitoring system performance of the firm will be increased. According to Chukwuka, Okegbe, Amahalu and Obi (2022), conflict of interest arises due to the concentrated ownership structure. Lu and Herremans (2019) claim board haracteristics seems to be negatively related to having a proactive environmental strategy. Okocha, Okoye, Amahalu and Obi (2022) found that board characteristics can improve environmental performance.

Theoretical Framework

Agency Theory

The Agency theory was first proposed by Jensen and Meckling (1976) in a theory of the firm based upon conflicts of interest between various contracting parties such as shareholders, corporate managers and debtors. However since then, the finance theory has developed both theoretically and empirically to allow a fuller investigation of the problems caused by divergences of interest between shareholders and corporate managers. The Agency theory indicates that agency problems arise because of the impossibility of perfectly contracting for every possible action of an agent whose decisions affect both his own welfare and the welfare of the principal. The main challenge that arises from the agency conflict is how to induce the agent to act in the best interests of the principal. Jensen and Meckling (1976) suggest that this can be achieved through incentive schemes for managers which reward them financially for maximizing shareholder interests. Such schemes typically include plans whereby senior executives obtain shares, perhaps at a reduced price, thus aligning financial interests of executives with those of shareholders.

Empirical Review

Le (2020) investigated the role of environmental management accounting on sustainable supply chain management and the link between sustainable supply chain management and efficiency including financial and environmental factors using questionnaire-based survey. The study designed and sent questionnaires to 600 construction material manufacturing enterprises in Vietnam and managed to collect 418 valid ones which were processed by SPSS 20.0 software. The results showed that environmental management accounting had a significantly positive impact on sustainable supply chain management. Therefore, if enterprises adopt environmental management accounting, they will more likely implement sustainable supply chain management more efficiently. On the other hand, the findings pointed out that sustainable supply chain management positively affect to both financial and environmental efficiency.

Okeke, Ifurueze and Nwadiaro (2021) analyzed the effect of carbon emission disclosure on economic value added of oil and gas firm in Nigeria stock exchange between the periods 0f 2018-2019. Panel Least Squared (PLS) method of data analysis was used. Secondary sources of data were employed; the interested variables were sourced from the annual report of the quoted oil and gas firms. Economic value added, effluent and waste treatment cost disclosure, Revenue growth of firm and Firm size were employed as the study variables. The study employed Causality Test; Hausman Test. fixed effect as well as random effect to analyses the included variables. From the analysis result the study found that effluent and waste treatment cost disclosure, has significant effect on economic value added, revenue growth of firm has positive significant effect on economic value added. Firm size has positive insignificant negative effect on economic value added.

Olayinka (2022) explored the effect of corporate governance dimensions on sustainability reporting. The study adopted ex-post facto research design. The population of the study comprised 169 quoted companies on the Nigerian Stock Exchange (NSE) as at December 31, 2019. A sample of 42 quoted companies that had complete and relevant data for the period of study (2010-2019) was selected through stratified and purposive sampling techniques. Data were extracted from published audited annual reports of firms and Global Reporting Initiative (GRI-4) performance indicators. Data were analyzed using descriptive and inferential statistic (multiple regression). The hypotheses were tested at 0.05 significance level. The findings revealed that corporate governance (CG) had positive and significant relationship with sustainability reporting of selected quoted companies in Nigeria (Adj. R^2) = 0.316, Wald-Stat = 333.68, p 0.05). This implies that, Board Size, Board Independence, Female Directors and Board Ownership are significant factors influencing changes in Sustainability Reporting. However, CEO Duality does not significantly influence changes in Sustainability Reporting. The study concluded that Corporate Governance affects Sustainability Reporting.

Muhammad, Karim, Nor and Ismail (2022) investigated the moderated effect of gender-diverse corporate boards on sustainable corporate governance practices in Malaysian financial and non-financial firms during the period 2011–2020, employing the dynamic estimator (S-GMM). During the COVID-19 pandemic, a negative relationship between ownership constructs and Global Reporting Initiative (GRI) indicators was observed in non-financial firms, whereas the opposite was reported for financial firms. Moreover, the moderated effect of gender-diverse boards is only substantiated in financial firms. The findings revealed that sustainable corporate governance was practised in financial firms but not in non-financial firms.

Methodology

The research design that was employed in this study is *ex-post facto* research design.The population of this study consists of all the twenty (20) listed oil and gas firms in Nigeria and South Africa. This entails 12 listed oil and gas firms in Nigeria, which are: 11 Plc (formerly Mobil Oil Plc); Anino International Plc; Capital Oil Plc; Conoil Plc; Eterna Plc; Forte Oil Plc; Japaul Oil & Maritime Services; MRS Oil Nigeria Plc; Oando Plc; Rak Unity Petroleum Company Plc; Seplat Petroleum Development Company Plc; Total Nigeria Plc and eight (8) listed oil and gas firms in South Africa which include: Engen Petroleum; Imvume; Johannesburg Gas Works; Montuak Energy; PetroSA; Sasol; Total South Africa; Transnet Pipelines companies listed on the Nigerian Exchange (NGX) Group and Johannesburg Stock Exchange (JSE) respectively as at 31st December, 2021. Seventeen (17) Oil and Gas companies were selected as the sample size of this study with the utilization of purposive sampling method, while the remaining three (3) oil and gas firms were not sampled due to non-availability of complete financial statements for the period of interest (2011-2021). Data were gathered from the published financial statements of listed ten (10) Oil and Gas companies in Nigeria: Capital Oil Plc; Conoil Plc; Eterna Plc; Forte Oil Plc;

Japaul Oil & Maritime Services; MRS Oil Nigeria Plc; Oando Plc; Rak Unity Petroleum Company Plc; Seplat Petroleum Development Company Plc; Total Nigeria Plc and seven (7) listed Oil and Gas firms in South Africa: Engen Petroleum; Imvume; Montuak Energy; PetroSA; Sasol; Total South Africa; Transnet Pipelines for eleven (11) years spanning from 2011 to 2021, using Purposive sampling method. The sample of the study consist of all companies that meet the following conditions: the shares of the company shall be traded in the financial market during the study period; the company has all the necessary data to calculate the variables of the study, in addition to the availability of data for the previous year for the study period; the company has not been incorporated or stopped trading during the study period; no merger process between firms; the sample firms publish audited financial statements using reporting period ended on December 31 each year. This study primarily utilized secondary data that were extracted from the stand alone reports, annual reports and statements of account of the sample listed Oil and Gas companies for the eleven (11) years period of interest spanning from 2011 to 2021.

Operationalisation of Variables

Table 1 Variable Description

Variable Type	Indicators	Variable Symbols	Definition and Measurement
Independent Variable (Board Characteristics)			
	Audit Committee Size	ACSZ	Measured as the total number of audit committee members
	Ownership Concentration	OWNC	The largest shareholder's shares / total shares
Dependent Variable			
	Environmental Remediation Disclosure	ERD	Total environmental remediation score disclosed Maximum number of environmental remediation disclosure score that a firm could disclose

DATA ANALYSIS AND PRESENTATION

Table 2 Pearson Correlation Matrix

	ERD	ACSZ	OWNC
EFD	1.0000		
ACSZ	0.4795	1.0000	
OWNC	-0.3228	0.3008	1.0000

Source: E-views 10.0 output, 2023

The Pearson correlation output in table 2 shows that ERD positively relates with ACSZ (0.4795) but negatively relates with OWNC (-0.3228).

Table 3: Panel Least Square Regression Analysis testing the effect of Board Characteristics on Environmental Remediation Disclosure

Dependent Variable: ERD
Method: Panel Least Squares
Date: 05/13/23 Time: 18:21
Sample: 2011 2021
Periods included: 11
Cross-sections included: 17
Total panel (balanced) observations: 187

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.671364	0.050256	13.35881	0.0000
ACSZ	0.040140	0.006327	6.344469	0.0000
OWNC	-0.194875	0.065777	-2.962665	0.0035
R-squared	0.265005	Mean dependent var		0.268182
Adjusted R-squared	0.257016	S.D. dependent var		0.135931
S.E. of regression	0.117168	Akaike info criterion		-1.434502
Sum squared resid	2.526018	Schwarz criterion		-1.382666
Log likelihood	137.1259	Hannan-Quinn criter.		-1.413498
F-statistic	33.17091	Durbin-Watson stat		1.387164
Prob(F-statistic)	0.000000			

Source: E-Views 10.0 Panel Regression Output, 2023

Interpretation of Regression Result

Table 3 reveals an adjusted R^2 value of 0.257016. The adjusted R^2, which represents the coefficient of multiple determinations imply that 25.70% of the total variation in the dependent variable (ERD) of sampled firms is jointly explained by the explanatory variables (ACSZ and OWNC). The adjusted R^2 of 25.70% did not constitute a problem to the study because the F- statistics value of 33.17091 with an associated Prob.>F = 0.000000 indicates that the model is fit to explain the relationship expressed in the study model and further suggests that the explanatory variables are properly selected, combined and used. The value of adjusted R^2 of 25.70% also shows that 74.30% of the variation in the dependent variable is explained by other factors not captured in the study model. This suggests that apart from ACSZ and OWNC there are other factors that mitigate ERD of listed oil and gas firms in Nigeria and South Africa. The results in table 3 illustrated that ACSZ has a positive and significant relationship with ERD measured with a beta coefficient (β_1) = 0.040140; t-value of 6.344469 and p- value of 0.0000 < 0.05 which is statistically significant at 5%: OWNC has a negative but significant relationship with ERD measured with a beta coefficient (β_2) = -0.194875; t-value of 0.065777 and p- value of 0.0035 < 0.05 which is statistically significant at 5%..

$$ERD = 0.671364 + 0.040140ACSZ- 0.194875OWNC + \mu$$

This beta coefficient revealed that if ACSZ increase by one unit, then the sampled oil and gas firms' ERD would increase by 4.01%. In the same vein, an increase in OWNC will cause ERD to reduce by 19.49%.

Decision

Based on the empirical evidence that suggests that there is a ACSZ and OWNC have a significant relationship with ERD of listed oil and gas firms in Nigeria and South Africa at 5% level of significance, thus, the alternative hypothesis of the study is accepted.

Findings

1. Audit Committee Size has a significant and positive effect on Environmental Remediation Disclosure of listed Oil and Gas firms in Nigeria and South Africa at 5% level of significance (β_1 = 0.040140; p-value = 0.0000).
2. Ownership Concentration has a significant but negative effect on Environmental Remediation Disclosure of listed Oil and Gas firms in Nigeria and South Africa at 5% level of significance (β_2 = -0.194875; p-value = 0.0035).

Conclusion

This study assessed the effect of Board Characteristics on Environmental Remediation Disclosure of listed Oil and Gas firms in Nigeria and South Africa during the period 2011-2021. Audit Committee Size and Ownership Concentration served as Board Characteristics proxies while Environmental Remediation Disclosure served as the dependent variable. To determine the relationship that exists amongst the study variables, Pearson Correlation Coefficient and Panel Least Square (PLS) regression estimate were employed. This study revealed that Audit Committee Size has a significant and positive effect on Environmental Remediation Disclosure (β_1 = 0.040140; p-value = 0.0000); Ownership Concentration has a significant but negative effect on Environmental Remediation Disclosure (β_2 = -0.194875; p-value = 0.0000) of listed Oil and Gas firms in Nigeria and South Africa at 5% level of significance respectively. In conclusion, the study upholds that Board Characteristics significantly affects Environmental Remediation Disclosure of listed Oil and Gas firms in Nigeria and South Africa.

Recommendations

1. In an attempt to decrease agency problems and spur managers to promote firm performance and involvement in environmental practices, the audit committee in a company should be encouraged and sustained.
2. In order to reverse the inverse relationship between ownership concentration and environmental remediation disclosure, there is need for increase in ownership concentration which would enhance the supervisory role of major shareholders in enterprise management to effectively limits managers' decisions and mitigates inefficient behavior within enterprises.

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